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Docket 80677JDP
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Joseph M. Geigel, et al.

SYSTEM AND METHOD FOR
AUTOMATIC LAYOUT OF
IMAGES IN DIGITAL ALBUMS

Serial No. 09/750,858

Filed 29 December 2000

Group Art Unit: 2179

Examiner: Nhon D. Nguyen

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Debra Nowacki
Debra Nowacki
March 7, 2007
Date

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF TRANSMITTAL

Enclosed herewith is Appellants' Appeal Brief for the above-identified application.

The Commissioner is hereby authorized to charge the Appeal Brief filing fee to Eastman Kodak Company Deposit Account 05-0225. A duplicate copy of this letter is enclosed.

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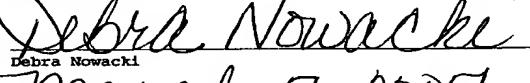
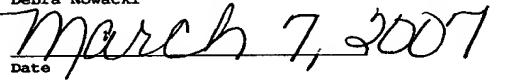
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Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134

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APPELLANT'S BRIEF ON APPEAL

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-15 and 17-32 which was contained in the Office Action mailed July 57, 2006.

A timely notice of appeal was filed on December 5, 2006

II. Real Party In Interest

As indicated above in the caption of the Brief, the Eastman Kodak Company is the real party in interest.

III. Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

IV. Status Of The Claims

Claims 1 – 15, and 17 – 32 have been rejected and are the subject of this appeal. Claims 16 and 33 – 36 have been canceled.

V. Status Of Amendments

No amendments were made to the claims after the final rejection of July 5, 2006.

VI. Summary of Claimed Subject Matter

Independent claim 1 reads as follows:

1. A digital image album layout system (Fig. 7, 124) comprising:
 - a page creator module (Fig. 7, 126; Spec p. 14, l. 21 – p.15, l. 18) operable to receive a set of images, a plurality of different user album preferences, and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences, and to generate album preference criteria using said user album preferences and album preference importance values, said page creator module having a first genetic engine 9 Fig. 7, 128) operable to execute genetic evolution calculations on a first genetic population of album criteria, said page creator module having a page evaluation module (Fig. 7, 130) operable to test said first genetic population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria;
 - an image placement module (Fig. 7, 132; Spec. p. 14, l. 21 – p. 15. l. 19) operable to receive the set of images, a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences, and to generate page preference criteria using said user page preferences and page preference importance values, said image placement module having a second genetic engine (Fig. 7, 136) operable to execute genetic evolution calculations on a second genetic population of page layout criteria, said image placement module having a layout evaluation module (Fig. 7, 134) operable to test said second genetic population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said page preference criteria;

wherein said page creator module (Fig. 7, 126) and said image placement module (Fig. 7, 132) operate separately.

Independent claim 2 reads as follows:

2. An automated album layout method (Fig. 1, 4 – 12, 52) responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:
 - receiving pluralities of user album preferences and album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. page 16, 1.1 – p.17, 1. 24; Fig. 1, 24),
 - generating a fitness function based upon said user album preferences and said album preference importance values (Spec. p. 19, 1. 12 – 19);
 - evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to said fitness function (Spec. p. 19, 1. 20 – p. 24, 1.6);
 - assigning each said image object to a page based on said evaluating;
 - displaying said page for user viewing (Figs. 10 – 16), and refining the distribution based on further user action (Spec. p. 24, 1. 7 – p.27, 1. 3).

Independent claim 3 reads as follows:

3. An automated layout and presentation method responsive to a set of inputs containing digital images, graphics, and other two-dimensional objects (Fig. 1, 4 – 12, 54), comprising the steps of:
 - receiving pluralities of user page preferences and page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance

value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 27, l. 4 – p.30, l. 25),

generating a fitness function based upon said user page preferences and said page preference importance values (Spec. p. 30, l.26 – p. 31, l. 17);

evaluating the ‘x’ and ‘y’ position coordinates, scale, and rotation of each of the input images objects within a page using a genetic algorithm, according to said fitness function (Spec. p. 31, l. 19 – p. 34, l. 15);

creating a page layout based on said evaluating (Fig. 1, 54);

displaying said page layout for user viewing (Figs. 23 - 38; Spec. p. 34, l. 16 – p. 36, l. 10)

refining said page layout based on further user action (Figs. 23 – 38; Spec. p. 34, l. 16 – p. 36, l. 10), and

formatting the page layout printing (Fig. 1, l. 56).

Independent claim 4 reads as follows:

4. A system for assigning a plurality of images to album pages (Fig. 7, 126), comprising:

means for receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

means for specifying an initial set of page assignments of said images to a genetic population (Fig. 1, 24);

a genetic engine operable to evolve said genetic population to produce a present set of image page assignments (Fig. 7, 128);

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score(Spec. p. 19, l. 20 – p. 24, l. 6), and

means for outputting said present set of image page assignments if said album score meets an album threshold value (Fig. 1, 56).

Independent claim 5 reads as follows:

5. A system for arranging a plurality of images on an album page (Fig. 7, l. 132), comprising:

means for receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. 27, l. 4 – p.30, l. 250,

means for specifying an initial set of image placement parameters of the images to a genetic population (Fig. 1, 24);

a genetic engine operable to evolve said genetic population to produce a present set of image placement parameters (Fig. 7, 136);

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score (Spec. p. 31 – p. 34, l.13);; and

a means for outputting said present set of image placement parameters if said page score meets a page threshold value (Fig. 1, 56).

Independent claim 6 reads as follows:

6. A system for assigning and placing a plurality of images on album pages (Fig. 7, 126), comprising:

means for receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16 – p. 17, l. 24),

means for specifying an initial set of page assignments of the images to a first genetic population (Fig. 1, 24);

a first genetic engine operable to evolve said first genetic population to produce a present set of image page assignments (Fig. 7, 122);

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score (Spec. p. 19, l. 20 – p. 24, 1.6);

means for outputting said present set of image page assignments if said album score meets an album threshold value Fig. 1, 56);

means for receiving a plurality of user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences Spec. p. 27, l. 4 – p. 30, l. 25),

means for specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments (Fig. 1, 24);

a second genetic engine operable to evolve said second genetic population to produce a present set of image placement parameters (Fig. 7, 136);

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score (Spec. p. 31, l. 19 – p. 34, 19), and

means for outputting said image placement parameters if said page score meets a page threshold value (Fig. 1, 56).

Independent claim 7 reads as follows:

7. A method of assigning a plurality of images to album pages (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of page assignments of the images to a genetic population (Fig. 1, 24);

evolving said genetic population to produce a present set of image page assignments (Fig. 7, 126);

generating an album fitness function using said user album preferences and album preference importance values(Spec. p. 19, l. 20 – p. 24, l. 6) ;

testing said present set of image page assignments according to said album fitness function to determine an album score (Spec. p. 19, l. 20 – p. 24, l. 6), and

outputting said present set of image page assignments if said album score meets an album threshold value (Fig. 1, 56).

Independent claim 8 reads as follows:

8. A method of assigning a plurality of images, having image parameters, to one or more pages in an album (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p.16, l. 1 – p. 17, l. 24);

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure Fig. 7, 126);

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure (Fig. 7, 126);

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters (Fig. 7, 126);

generating an album fitness function using said user album preferences and album preference importance values (Spec. p. 19, l. 20 – p. 24, l. 6);

testing said present set of page criteria according to said album fitness function to determine an album score (Spec. p. 19, l. 20 – p. 24, l. 6);

repeating said evolving and calculating steps if said album score fails to meet an album threshold value (Spec. p. 19, l. 20 – p. 24, l. 6), and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value (Fig. 1, 56).

Independent claim 12 reads as follows:

12. A method of assigning a plurality of images, having image parameters, to one or more pages in an album (Fig. 7, 126), comprising the steps of:

receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure (Fig. 7, 126);

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure (Fig. 7, 126);

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters (Fig. 7, 126);

generating an album fitness function using said user album preferences and album preference importance values (Spec. p. 18, l. 20 – p. 24, l. 6);

testing said present set of page criteria according to said album fitness function to determine an album score (Spec. p. 18, l. 20 – p. 24, l. 6);

repeating said evolving and calculating steps if said album score fails to meet an album threshold value (Spec. p. 18, l. 20 – p. 24, l. 6), and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value (Fig. 1, 56);

wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function (Figs. 3 – 6).

Independent claim 14 reads as follows:

14. A method of assigning a plurality of images, having image parameters, to one or more pages in an album (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure (Fig. 7, 126);

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure (Fig. 7, 126);

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters (Fig. 7, 126);

generating an album fitness function using said user album preferences and album preference importance values (Spec. p. 18, l. 20 – p. 24, l. 6);

testing said present set of page criteria according to an album fitness function to determine an album score (Spec. p. 18, l. 20 – p. 24, l. 6);

repeating said evolving and calculating steps if said album score fails to meet an album threshold value (Spec. p. 18, l. 20 – p. 24, l. 6), and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value;

wherein said testing step further comprises the steps of:

comparing said present set of page criteria and respective said user album preferences to generate preliminary album scores (Spec. p. 18, l. 20 – p. 24, l. 6) and

scaling said preliminary album scores in accordance with respective said album preference importance values to produce a final album score (Spec. p. 18, l. 20 – p. 24, l. 6).

Independent claim 17 reads as follows.

17. A method of arranging a plurality of images on an album page (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of image placement parameters of the images to a genetic population (Fig. 1, 24);

evolving said genetic population to produce a present set of image placement parameters (Fig. 7, 136);

generating a page fitness function based upon said user page preferences and said page preference importance values (Spec. p. 31, l. 19 – p. 34, l. 15);

testing said present set of image placement parameters with said page fitness function to determine a page score (Spec. p. 31, l. 19 – p. 34, l. 15; and

outputting said image placement parameters if said page score meets a page threshold value (Fig. 1, 56).

Independent claim 18 reads as follows:

18. A method of arranging one or more images, having image parameters, on an album page (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of positioning parameters for each of the one or more images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure (Fig. 1, 24);

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure (Fig. 7, 136);

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters (Fig. 7, 136);

generating a page fitness function based upon said user page preferences and said page preference importance values (Spec. p. 31, l. 19 – p. 34, l. 15);

testing said present set of layout criteria according to a said page fitness function to determine a page score (Spec. p. 31, l. 19 – p. 34, l. 15);

repeating said evolving and calculating steps if said page score fails to meet a page threshold value (Spec. p. 31, l. 19 – p. 34, l. 15); and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value (Fig. 1, 56).

Independent claim 22 reads as follows:

22 . A method of arranging one or more images, having image parameters, on an album page (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of positioning parameters for each of the one or more images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure (Fig. 1, 24);

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure (Fig. 7., 136);

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters (Fig. 7, 136);

generating a page fitness function based upon said user page preferences and said page preference importance values (Spec. p. 31, l. 19 – p. 34, l. 15);

testing said present set of layout criteria according to a page fitness function to determine a page score (Spec. p. 31, l. 19 – p. 34, l. 15);

repeating said evolving and calculating steps if said page score fails to meet a page threshold value (Spec. p. 31, l. 19 – p. 34, l. 15); and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value (Fig. 1, 56);

wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function (Figs. 3 – 6).

24. A method of arranging one or more images, having image parameters, on an album page (Fig. 7, 126), comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 16, l. 1 – p. 17, l. 24),

specifying an initial set of positioning parameters for each of the one or more images (Fig. 1, 24);

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure (Fig. 1, 24);

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure (Fig. 7., 136);;

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters (Fig. 7., 136);

generating a page fitness function based upon said user page preferences and said page preference importance values (Spec. p. 31, l. 19 – p. 34, l. 15);

testing said present set of layout criteria according to said page fitness function to determine a page score (Spec. p. 31, l. 19 – p. 34, l. 15);
repeating said evolving and calculating steps if said page score fails to meet a page threshold value (Spec. p. 31, l. 19 – p. 34, l. 15); and
outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value (Fig. 1, 56) ;
wherein said testing step further comprises the steps of:
comparing said layout criteria to layout preference criteria and generating a preliminary page score (Spec. p. 31, l. 19 – p. 34, l. 15) and scaling said preliminary page score in accordance with page importance parameters to produce a final page score (Spec. p. 31, l. 19 – p. 34, l. 15).

Independent claim 27 reads as follows:

27. A method of assigning and placing a plurality of images on album pages (Fig. 7, 126), comprising the steps of:
receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences (Spec. p. 16, l. 1 – p. 17, l. 24),
specifying an initial set of page assignments of the images to a first genetic population (Fig. 1, 24;);
evolving said first genetic population to produce a present set of image page assignments (Fig. 7, 126);
generating an album fitness function based upon said user album preferences and said album preference importance values (Spec. p. 19, l. 20 – p. 24, l. 6);
testing said present set of image page assignments according to said album fitness function to determine an album score (Spec. p. 19, l. 20 – p. 24, l. 6);

outputting said present set of image page assignments if said album score meets an album threshold value (Fig. 7, 126 – 132);

receiving a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences (Spec. p. 27, l. 4 – p.30, l. 25),

specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments (Spec. p. 27, l. 4 – p.30, l. 25);

evolving said second genetic population to produce a present set of image placement parameters (Spec. p. 27, l. 4 – p.30, l. 25);

generating a page fitness function based upon said user page preferences and said page preference importance values (Spec. p. 30, l. 26 – p. 31, l.17);

testing said present set of image placement parameters with a page fitness function to determine a page score (Spec. p. 30, l. 26 – p. 31, l.17; and

outputting said image placement parameters if said page score meets a page threshold value (Fig. 1, 56);

wherein said evolving of said first genetic population, said generating of said album fitness function, and said testing according to said album fitness function are separate from said evolving of said second genetic population, said generating of said page fitness function, and said testing with said page fitness function (Fig. 7, 126 and 132).

VII. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented for review by the Board of Patent Appeals and Interferences:

1. The rejection of claims 1 – 9, 12 – 15, and 17 – 32 under 35 U.S.C. §103(a) as being unpatentable over Koba U.S. Patent 6,222,647 in view of Guttman et al. U.S. Patent 6,366,918.
2. The rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable over Koba in view of Guttman and further in view of Wang U.S. Patent 6,014,458.

VIII. Arguments

Claims 1 – 9, 12 – 15, and 17 – 32 are patentable under 35 U.S.C. §103(a) over Koba and Guttman.

Argument for Claim 1

Claim 1 requires that a page creator module and said image placement module operate separately. Each of these two modules includes its own genetic engine that produces a respective genetic population and its own evaluation module that tests the respective genetic population. Koba and Guttman, in any combination, do not teach or suggest a page creator module and image placement module that operate separately. Koba, the rejection states in relation to Claim 1:

"does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to generate album preference important values indicating a weighting of corresponding user preferences relative to each other."

Guttman discloses the use of a single genetic engine to execute genetic evolution calculations and produce a single genetic population:

"More specifically, the present invention uses a genetic algorithm approach to produce the optimized publication layouts. In a timely manner, the invention generates and evaluates a large number of possible layouts and selects the optimum layout. The optimal layout has an optimal relationship between the placement of advertisements and editorials on the pages of the publication resulting in a maximization of revenue and a minimization of costs." (Koba,
col. 3, lines 1-9; also see col. 7, lines 9-29 and col. 8, lines 1-17)

In Guttman, there is also a single evaluation of the genetic population for all criteria. Guttman states:

"Block 306 represents the computer 100 evaluating the fitness of the different publication layouts. As indicated above, each of the ordered list in the population comprises the same Placeable Item objects 210, but in different orders, and the Dummy objects 212 are evaluated depending

whether or not all the Placeable Item objects 210 in the ordered list can be placed in the publication layout with the attributes of both the Placeable Item objects 210 and the Dummy objects 212 satisfied. The evaluation of the publication layout represented by the Dummy objects 212 comprises an aggregation of the fitness values for each individual Placeable Item object 210 in the list. Also included in the evaluation is a calculation to determine how much it would cost to print each layout. Further, the evaluation includes an analysis of the aesthetics of the layout. These various criteria are then combined into a total fitness value for the specific ordered list." (Koba, Figure 3; col. 8, lines 1-17; also see col. 7, lines 9-29)

Koba, similarly, has a single confirmation step S109. Koba states:

"In step S109, the user checks the layout pattern of the page which has been laid out, and determines whether to confirm it. If NO in step S109, the flow advances to step S110 to input information indicating whether to modify all the pages. If it is determined that all the pages are to be modified, the flow advances to step S105. If it is determined that some pages are to be modified, the flow returns to step S106 to determine a template for the designated page again." (Koba, Figure 2; col. 4, lines 49-56; also see Figure 4; col. 7, lines 50-63)

A combination of the two cited references would teach a single evaluation. This is unlike Claim 1, in which a page evaluation module and a layout evaluation module each test a respective genetic population.

Claim 1 also requires a page creator module operable to receive images, album preferences, and album preference importance values; to generate album preference criteria using the album preferences and album preference importance values; and to test a first genetic population for fitness to the album preference criteria. The album preference importance values that are received indicate a weighting of a corresponding one of the album preferences relative to the other album preferences. Claim 1 also requires an image placement module operable to receive the images, page preferences, and page preference importance values; to generate page preference criteria using the page preferences and page

preference importance values, and to test a second genetic population for fitness to the page preference criteria. The page preference importance values that are received indicate a waiting of a corresponding one of the page preferences relative to the other page preferences.

The cited references do not teach or suggest a page creator module operable to receive album preference importance values and an image placement module operable to receive page preference importance values. The rejection argues that the combination of the cited references teaches a different feature, which does not meet the language of Claim 1. The rejection states, in relation to Claim 1:

"Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to generate album preference important values indicating a weighting of corresponding user preferences relative to each other. Guttman teaches a genetic algorithm approach ..." (emphasis added)

The office action states similarly in the Response to Arguments:

"Koba does not teach importance values indicating a weighting of corresponding user preferences relative to each other, however, as a combination between Koba and Guttman, Koba's system would have implemented Guttman's genetic algorithm technique of mutation and cross-over functions to evaluate importance values indicating a weighting of corresponding user preferences relative to each other. By doing this, Koba's system would have been improved the evaluating importance-values process by using Guttman's efficient genetic algorithm, instead of importance values are associated with individual images."

(citations omitted)

To whatever extent the combination of the cited references teaches use of the genetic algorithm of Guttman to generate preference importance values, that teaching argues for the patentability of Claim 1, since Claim 1 requires a page creator module operable to receive images, album preferences, and album preference importance values and an image placement module operable to receive the images, page preferences, and page preference importance values.

Claim 1 requires a page evaluation module operable to test a first genetic population for fitness to album preference criteria generated using user album preferences and album preference importance values. Claim 1 also requires a layout evaluation module operable to test a second genetic population for fitness to page preference criteria generated using user page preferences and page preference importance values. The office action stated, in this regard:

"as a combination between Koba and Guttman, Koba's system would have implemented Guttman's genetic algorithm technique of mutation (e.g., col. 7, lines 47-59) and cross-over functions (e.g., col. 8, lines 42-47) to evaluate importance values indicating a weighting of corresponding user preferences relative to each other. By doing this, Koba's system would have been improved the evaluating importance-values process by using Guttman's efficient genetic algorithm, instead of importance values are associated with individual images."

The office action does not address how one of skill in the art would have determined the user preferences to use in a combination of Koba and Guttman. The rejection argues that, in the combination of the two cited references, the system of Koba would have looked to the criteria of Guttman rather than importance values associated with individual images. The cited references do not support this position. In Koba, the user inputs the degree of importance of each image along with preferences for various page assignment and layout criteria. (Koba, col. 6, lines 7-20; col. 6, lines 43-59; col. 7, lines 20-30; col. 7, lines 37-39) Guttman uses multiple criteria to select an optimum layout that:

"has an optimal relationship between the placement of advertisements and stories on the pages of the publication, the maximization of revenues, and the minimization of printing costs." (Guttman, abstract; also see col. 3, lines 5-9)

"The evaluation of the publication layout represented by the Dummy object 212 comprises an aggregation of the fitness values for each individual Placeable Item object 210 in the list. Also included in the evaluation is a calculation to determine how much it would cost to print each layout. Further, the evaluation includes an analysis of the aesthetics

of the layout. These various criteria are then combined into a total fitness value for the specific ordered list." (Guttman, col. 8, lines 9-17; emphasis added)

Why would one of skill in the art not include the degree of importance of each image along with other criteria in a combination of Koba and Guttman, since Guttman teaches considering multiple criteria?

The cited references, in any combination, do not teach or suggest generation of fitness criteria using user preferences and importance values for those preferences. Koba states, in relation to preference criteria:

"In step S203, a questionnaire is given to the user to cause the user to input the following pieces of information to the initial parameter setting means 33 by using the keyboard 7: (1) the degree of importance of each image; (2) a criterion for determining the assignment of the images to the respective pages, e.g., photographic date information or the degree of importance of each image; (3) the approximate number of images to be laid out per page; (4) the approximate layout position of each image; (5) a favorite color; and the like. For example, as (4) the layout position of each image, the user inputs information indicating his/her preference for a layout pattern, i.e., a neat layout like the one shown in FIG. 6A or an untidy layout like the one shown in FIG. 6B, in laying out three images on one page." (Kobe, col. 6, lines 7-20)

"In step S205, the initial parameter setting means 33 determines the images, of the images belonging to each group, which are to be laid out on each page. Assume that the user has designated the assignment of three images to each page in response to question (3) in step S203. In this case, if, for example, the seven images formed into the first group are sequentially laid out, from the first image, three images at a time for each page, and three images are laid out on each of the first and second pages, whereas one image (the seventh image) is laid out on the third page. When, however, only one image is laid out on the third page, the resultant layout is poor in balance with an excessive blank space. For this reason, it is determined that three images are assigned to the second page. This

operation can be realized by reducing the image designated as an image with a low degree of importance by the user, as needed." (Koba, col. 6, lines 43-59)

"In step S206, the initial parameter setting means 33 sets the initial parameters required for automatic layout processing for each page. More specifically, the initial parameter setting means 33 sets the approximate layout position of each image on one page, which has been designated in response to question (4) in step S203, and a background image corresponding to the favorite color input in response to question (5) in step S203 as initial parameters. As the background image, an image with a sense of the season is set in accordance with the photographic date information input together with the images. In addition, if caption information is input, a background is set on the basis of this information." (Koba, col. 7, lines 20-30)

"In step S207, the automatic layout means 31 execute automatic layout processing on the basis of the initial parameter set in the above manner." (Koba, col. 7, lines 37-39)

In Koba, the user inputs the degree of importance of each image along with preferences for various page assignment and layout criteria. This is unlike the claimed invention, in which importance values are not associated with individual images, but rather indicate a weighting of corresponding user preferences relative to each other.

Guttman et al. optimizes a genetic population relative to costs and revenues:

"An optimal layout is a layout that satisfies advertisers' requirements, maximizes revenues, and minimizes costs." (Guttman et al., col. 8, lines 21-23)

This is unlike the claimed invention, which tests genetic populations with preference criteria generated using user preferences and importance values that indicate weightings of the user preferences relative to each other.

The rejection argues motivation for combining Koba and Guttmann that states:

"It would have been obvious to an artisan at the time of the invention to use the teaching from Guttman of applying genetic programming in Koba's system since the uses of a genetic algorithm approach would have generated and evaluated, in a timely manner, a large number of possible page layouts and selected optimum layout."

A textbook discussion of genetic algorithms indicates that operation of a combination of Guttman et al. and Koba in "a timely matter", is not readily predictable:

"Because there are many heuristics to choose as well as parameters to set, it is hard to make firm theoretical statements about building classifiers by means of evolutionary methods. The performance and search time depend upon the number of bits, the size of a population, the mutation and crossover rates, choice of features and mapping from chromosomes to the classifier itself, the inherent difficulty of the problem and possibly parameters associated with other heuristics." (*Pattern Classification*, 2nd ed., R. Duda, P. Hart, D. Stork, John Wiley & Sons, Inc., New York, 2001, page 378)

One of skill in the art, in view of the above-quote from *Pattern Classification*, would not be motivated by Guttman et al., col. 3, lines 1-9 to combine modify Koba with Guttman et al. on the basis of Guttman et al.'s discussion of "a timely manner". The motivation to combine Koba and Guttman et al. has also not overcome the teachings of early cited Johnson (US 2001/0019630). The mention in Johnson, of the use of genetic programming teaches or suggests that Johnson was aware of both genetic programming and genetic algorithms and, despite that knowledge, chose to use fuzzy logic in a classifier. As earlier discussed, Johnson's fuzzy logic approach has advantages.

Claim 1 is therefore patentable over the cited references.

Argument for Claims 29 - 30

Claims 29-30 are patentable as depending from Claim 1.

The above discussions of a claim requirement of importance values that are not associated with individual images and lack of motivation for the cited combination of references are applicable to all of the claims.

Argument for Claim 2

The office action stated in relation to Claim 2:

"As per independent claim 2, Koba teaches an automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

"receiving pluralities of user album preferences, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology and unity (col. 6, lines 7-42 and col. 6, line 55 - col. 7, line 19).

"generating a fitness function based upon said user album preferences (e.g., col. 6, lines 43-59),

"evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to said fitness function (col. 6, lines 43-59);

"assigning each image object to a page based on user preferences, including balance (col. 6, line 52 - col. 7, line 13);

"displaying said page for user viewing, and refining the distribution based on said evaluating (S210 of fig. 4 and fig. 5C and 5G).

"Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to generate album preference important values indicating a weighting of corresponding user preferences relative to each other. Guttman teaches a genetic algorithm approach to produce the optimized publication layouts by generating and evaluating a large number of possible layouts and selects the optimum layout (col. 3, lines 1-9) using mutation (e.g., col. 7, lines 47-59) and cross-over functions (e.g., col. 8, lines 42-47). It would have been obvious to an artisan at the time of the invention to use the teaching from Guttman of applying genetic programming in Koba's system since the uses of a genetic algorithm approach would have generated and evaluated, in a timely manner, a large number of possible page layouts and selected optimum layout."

Claim 2 requires receiving user album preferences and album preference importance values and generating a fitness function based upon the received user album preferences and received album preference importance values. As was discussed above in relation to Claim 1, there is no teaching or suggestion in the cited references as to receiving album preference importance values. Guttman is cited in relation to generating and evaluating possible layouts. This does not meet the language of Claim 2. Claim 2 is therefore patentable over the cited references.

Argument for Claims 3 - 5

Claims 3-5 are patentable on grounds like those of Claim 2.

Argument for Claim 6

Claim 6 requires:

"means for receiving a plurality of user album preferences and a plurality of album preference importance values,

and

"means for receiving a plurality of user page preferences and a plurality of page preference importance values".

and, for this reason is allowable on the grounds discussed above in relation to the receiving of preference importance values.

Claim 6 also states:

"a first genetic engine operable to evolve said first genetic population to produce a present set of image page assignments"

and

"A second genetic engine operable to evolve said second genetic population to produce a set of image placement parameters".

Claim 6, thus, requires two different genetic engines, each operable to evolve a different genetic population. As discussed above, the cited combination of references teaches use of a single genetic engine operable on a single genetic population, which does not meet the language of Claim 6.

Claim 6 requires two different evaluation modules:

"a page evaluation module operable to generate an album fitness function"

and

"a layout evaluation module operable to generate a page fitness function". As discussed above, the cited references teach only a single evaluation of the genetic population.

Claim 6 requires both:

"means for outputting said present set of image page assignments if said album score meets an album threshold value"

and

"means for outputting said image placement parameters if said page score meets a page threshold value".

This is also incompatible with the single evaluation taught by the cited references.

Claim 6 also requires:

"means for specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments".

The combination of the cited references teaches no such means for specifying, since the criteria are considered in a single valuation. Claim 6 is therefore patentable over the references.

Arguments for other Claims under appeal

Claims 7-8 are patentable on grounds like those discussed above in relation to Claim 2.

Claims 28 and 31-32 are patentable as depending from Claim 7.

Claims 9 and 13 are patentable as depending from Claim 8.

Claims 12, 14, 17-18, 22, and 24 are patentable on grounds like those discussed above in relation to Claim 2.

Claim 15 is patentable as depending from Claim 14.

Claims 19-21, 23, and 25 are patentable as depending from Claim 18.

Claim 26 is patentable as depending from Claim 24.

Claim 27 is patentable on the same grounds like those discussed above in relation to claim 1.

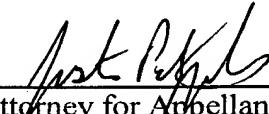
Claims 10 and 11 are patentable under 35 U.S.C. §103(a) over Koba, Guttman, and Wang.

Claims 10 and 11 are patentable as depending from claim 8.

IX. Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1 – 15 and 17 – 32.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

XI. Appendix I - Claims on Appeal

1. A digital image album layout system comprising:

a page creator module operable to receive a set of images, a plurality of different user album preferences, and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences, and to generate album preference criteria using said user album preferences and album preference importance values, said page creator module having a first genetic engine operable to execute genetic evolution calculations on a first genetic population of album criteria, said page creator module having a page evaluation module operable to test said first genetic population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria;

an image placement module operable to receive the set of images, a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences, and to generate page preference criteria using said user page preferences and page preference importance values, said image placement module having a second genetic engine operable to execute genetic evolution calculations on a second genetic population of page layout criteria, said image placement module having a layout evaluation module operable to test said

second genetic population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said page preference criteria; wherein said page creator module and said image placement module operate separately.

2. An automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

receiving pluralities of user album preferences and album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

generating a fitness function based upon said user album preferences and said album preference importance values;

evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to said fitness function;

assigning each said image object to a page based on said evaluating;

displaying said page for user viewing, and refining the distribution based on further user action.

3. An automated layout and presentation method responsive to a set of inputs containing digital images, graphics, and other two-dimensional objects, comprising the steps of:

receiving pluralities of user page preferences and page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

generating a fitness function based upon said user page preferences and said page preference importance values;

evaluating the 'x' and 'y' position coordinates, scale, and rotation of each of the input images objects within a page using a genetic algorithm, according to said fitness function;

creating a page layout based on said evaluating;

displaying said page layout for user viewing;

refining said page layout based on further user action, and

formatting the page layout printing.

4. A system for assigning a plurality of images to album pages, comprising:

means for receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference

importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

means for specifying an initial set of page assignments of said images to a genetic population;

a genetic engine operable to evolve said genetic population to produce a present set of image page assignments;

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score, and

means for outputting said present set of image page assignments if said album score meets an album threshold value.

5. A system for arranging a plurality of images on an album page, comprising:

means for receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

means for specifying an initial set of image placement parameters of the images to a genetic population;

a genetic engine operable to evolve said genetic population to produce a present set of image placement parameters;

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score; and

a means for outputting said present set of image placement parameters if said page score meets a page threshold value.

6. A system for assigning and placing a plurality of images on album pages, comprising:

means for receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

means for specifying an initial set of page assignments of the images to a first genetic population;

a first genetic engine operable to evolve said first genetic population to produce a present set of image page assignments;

a page evaluation module operable to generate an album fitness function using said user album preferences and album preference importance values and to test said present set of image page assignments according to said album fitness function to determine an album score;

means for outputting said present set of image page assignments if said album score meets an album threshold value;

means for receiving a plurality of user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

means for specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments;

a second genetic engine operable to evolve said second genetic population to produce a present set of image placement parameters;

a layout evaluation module operable to generate a page fitness function using said user page preferences and page preference importance values and to test said present set of image placement parameters with a said page fitness function to determine a page score, and

means for outputting said image placement parameters if said page score meets a page threshold value.

7. A method of assigning a plurality of images to album pages, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference

importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences;

specifying an initial set of page assignments of the images to a genetic population;

evolving said genetic population to produce a present set of image page assignments;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of image page assignments according to said album fitness function to determine an album score, and

outputting said present set of image page assignments if said album score meets an album threshold value.

8. A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences;

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to said album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value.

9. The method of Claim 8 wherein said image parameters include an image event value, image chronology value, and image emphasis value.

10. The method of Claim 8 wherein said genome structure is a tree structure.

11. The method of Claim 8 wherein said genome structure is selected from one of a tree structure, an array structure, or a list structure.

12. A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of user album preferences and a plurality of album preference importance values, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology, and unity, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to said album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value; wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function.

13. The method of Claim 8 wherein calculation of said page criteria includes calculation of an emphasis value range, a page count value, and a balance threshold value.

14. A method of assigning a plurality of images, having image parameters, to one or more pages in an album, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments defining the album page assignment for each of the plurality of images;

initializing a genetic population by assigning said initial set of page assignments to genes within an album genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of page assignments within said album genome structure;

calculating a present set of page criteria according to said present set of page assignments, the image parameters, and a set of album page parameters;

generating an album fitness function using said user album preferences and album preference importance values;

testing said present set of page criteria according to an album fitness function to determine an album score;

repeating said evolving and calculating steps if said album score fails to meet an album threshold value, and

outputting image page assignments according to said present page assignment if said album score meets said album threshold value;

wherein said testing step further comprises the steps of:

comparing said present set of page criteria and respective said user album preferences to generate preliminary album scores and

scaling said preliminary album scores in accordance with respective said album preference importance values to produce a final album score.

15 . The method of Claim 14 wherein said page criteria include balance, emphasis, chronology, and unity.

16 (cancelled).

17. A method of arranging a plurality of images on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of image placement parameters of the images to a genetic population;

evolving said genetic population to produce a present set of image placement parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of image placement parameters with said page fitness function to determine a page score; and

outputting said image placement parameters if said page score meets a page threshold value.

18. A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of layout criteria according to a said page fitness function to determine a page score;

repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value.

19. The method of Claim 18 wherein said image parameters include an image emphasis value.

20. The method of Claim 18 wherein said genome structure is an array.

21. The method of Claim 18 wherein said genome structure is selected from one of a tree structure, an array structure or a list structure.

22 . A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, said user page preferences indicating parameter values including at least one of white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of layout criteria according to a page fitness function to determine a page score;

repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value;

wherein said evolution step genetic function includes a genetic mutation function and a genetic crossover function.

23. The method of Claim 18 wherein calculation of said layout criteria includes calculation of at least one of white space area, image overlap, image rotation, spatial balance, rotational balance, border symmetry, and image emphasis values.

24. A method of arranging one or more images, having image parameters, on an album page, comprising the steps of:

receiving a plurality of different user page preferences and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of positioning parameters for each of the one or more images;

initializing a genetic population by assigning said initial set of positioning parameters as genes in a page genome structure;

evolving said genetic population in accordance with a genetic function to produce a present set of positioning parameters within said page genome structure;

calculating a set of present layout criteria, according to said present set of positioning parameters, the image parameters, and a set of page layout parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of layout criteria according to said page fitness function to determine a page score;

repeating said evolving and calculating steps if said page score fails to meet a page threshold value; and

outputting a page layout according to said present set of positioning parameters if said page score meets said page threshold value;

wherein said testing step further comprises the steps of:

comparing said layout criteria to layout preference criteria and generating a preliminary page score and

scaling said preliminary page score in accordance with page importance parameters to produce a final page score.

25. The method of Claim 18 wherein said page criteria include at least one of page size, maximum image rotation, scaling range, white space range, overlap range, and border deviation.

26. The method of Claim 24 wherein said layout preference criteria are based upon user preferences.

27. A method of assigning and placing a plurality of images on album pages, comprising the steps of:

receiving a plurality of different user album preferences and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences,

specifying an initial set of page assignments of the images to a first genetic population;

evolving said first genetic population to produce a present set of image page assignments;

generating an album fitness function based upon said user album preferences and said album preference importance values;

testing said present set of image page assignments according to said album fitness function to determine an album score;

outputting said present set of image page assignments if said album score meets an album threshold value;

receiving a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences,

specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments;

evolving said second genetic population to produce a present set of image placement parameters;

generating a page fitness function based upon said user page preferences and said page preference importance values;

testing said present set of image placement parameters with a page fitness function to determine a page score; and

outputting said image placement parameters if said page score meets a page threshold value;

wherein said evolving of said first genetic population, said generating of said album fitness function, and said testing according to said album fitness function are separate from said evolving of said second genetic population, said generating of said page fitness function, and said testing with said page fitness function.

28. The method of claim 7, further comprising the step of:
repeating said evolving and testing steps if said album score fails to meet said album threshold value.

29. The system of claim 1, wherein the genetic evolution calculations performed by at least one of the first and second genetic engines include the application of a genetic mutation function.

30. The system of claim 1, wherein the genetic evolution calculations performed by at least one of the first and second genetic engines include the application of a genetic crossover function.

31. The method of claim 7, wherein the step of evolving said genetic population includes the application of a genetic mutation function.

32. The method of claim 7, wherein the step of evolving said genetic population includes the application of a genetic crossover function.

33-36 (cancelled).

XI. Appendix II - Evidence

None.

XII. Appendix III – Related Proceedings

None.